

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NORTH CAROLINA
SOUTHERN DIVISION**

VICTORIA CAREY, MARIE BURRIS,
MICHAEL KISER, BRENT NIX, and
ROGER MORTON, individually and on
behalf of all others similarly situated,

Plaintiffs,

v.

THE CHEMOURS COMPANY FC, LLC,
THE CHEMOURS COMPANY, E.I.
DUPONT de NEMOURS AND COMPANY,
INC., E.I. DUPONT CHEMICAL
CORPORATION, ELLIS H. MCGAUGHY,
and MICHAEL E. JOHNSON,

Defendants.

Civil Action No. 7:17-cv-00189-D
Civil Action No. 7:17-cv-00197-D
Civil Action No. 7:17-cv-00201-D

**DEFENDANTS' MEMORANDUM OF LAW IN SUPPORT OF
MOTION TO EXCLUDE TESTIMONY OF KIMBERLY A. GRAY, PH.D.
AND ROGER W. GRIFFITH, P.E.**

Plaintiffs offer the opinions of toxicologists Dr. Kimberly Gray and Roger Griffith to support their motion for class certification. Dr. Gray opines that bacteria and biofilm in the putative class members' water sources contain proteins that bind PFAS to pipes and water heaters in areas that receive water from private wells in the affected counties or from the Cape Fear River. Mr. Griffith opines that PFAS in water-heater "sludge" will be released and reintroduced into the putative class members' plumbing systems and tap water due to the turbulence created by the dip tube employed in water heater designs.

Plaintiffs rely on these opinions to support their claim that all putative class members must receive reverse-osmosis water filters and replacement of their hot water heaters to protect them from the dangers of PFAS exposure.

As shown below, Dr. Gray's and Mr. Griffith's opinions should be excluded under Rule 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), because their opinions are not reliable. Among other shortcomings, Dr. Gray's opinions are purely speculative and theoretical, accomplished without any evaluation of the underlying data in this case—which in fact are directly inconsistent with the assumptions made in her hypothesis. Mr. Griffith's opinions are completely speculative; he assumes that all hot water heaters owned by members of the proposed class are contaminated with PFAS sediment without ever having measured or tested any of those water heaters, assumes that there is no way to effectively remove PFAS sediment despite evidence to the contrary, and assumes that all hot water heaters must be replaced regardless of levels of PFAS sediment because he assumes that any non-zero level of PFAS sediment is potentially hazardous. The Court should exclude such speculation in the garb of expert testimony.

RELEVANT BACKGROUND

I. Dr. Kimberly Gray

Dr. Gray is an environmental engineer. [D.E. 336-26 (Gray Rep.) at 2]. She holds a faculty position in the Department of Civil and Environmental Engineering at Northwestern University. [*Id.*]. Dr. Gray was retained to offer her opinion on the adsorption and accumulation of PFAS “to pipe and premise plumbing surfaces in the Class Area.” [Ex. 1, Gray Rebuttal Rep. at 1]. She offers the following opinions in this case:

1. Finished drinking water contains bacteria, organic material, nutrients, and minerals. Over time, live bacteria and dead cells attach to the pipe walls and slowly grow into a biofilm that provides them with a better chance of survival. The biofilm and the bacteria contain proteins which bind PFAS, accumulate PFAS over long times and dynamically sorb, desorb and cycle PFAS into the water. All pipe surfaces support biofilms.

2. Pipe walls also accumulate scale, typically made up of calcium carbonate (CaCO₃) and iron hydroxides (rust). Scale formation promotes PFAS sorption due to complexation and electrostatic interactions. The rough surfaces created by scale can also promote biofilm formation and associated mechanisms of PFAS sorption (protein binding).
3. Hot water heaters hold a large volume of water at elevated temperature which causes minerals to precipitate and settle out. These minerals are similar in composition to scale. PFAS are attracted to the positive charge (electrostatic attraction and ionic binding) of mineral surfaces and will accumulate at the bottom of the tank creating a store of in-place pollutants and a significant threat to home owners' health.

[D.E. 336-26 at 2].

In short, Dr. Gray opines that over time, bacteria from drinking water attaches to pipe walls and grows into a biofilm. [*Id.* at 2, 12]. She claims that the bacteria and biofilm contain proteins that bind PFAS to pipes and water heaters in areas that receive water from private wells in the affected counties or from the Cape Fear River. [*Id.*].

II. Roger Griffith

Mr. Griffith is a mechanical engineer. [D.E. 336-27 (Griffith Rep.) ¶ 3]. He is the founder and principal engineer of Griffith Engineering & Consulting, Inc. [*Id.*]. He was retained by class plaintiffs “to investigate the impact of water heaters contaminated with GenX and PFAS and to provide recommendations to rectify this issue.” [*Id.* ¶ 1]. Specifically, he was asked to opine on the following questions:

1. [I]f PFAS contamination is eliminated at the source of public drinking water supplies (e.g., at the outflow) for residents in the affected counties who receive water from public utilities, will the PFAS in the sediment layer continue to pose a source of contamination?
2. Is there a known or established method that would be capable of eliminating PFAS-contaminated sediment remaining in water heaters?

[*Id.* ¶ 24].

Mr. Griffith opines that, based upon his “review of prior sampling results from the sediment and water in the water heaters, incoming water contaminated with Fayetteville Works PFAS contaminate the sediment layer in water heaters in a similar concentration as in the incoming water.” [*Id.* ¶ 54]. He also concludes that no methodology currently exists that will completely remove all sediment from a residential water heater.” [*Id.*]. Finally, he concludes that “the replacement of contaminated water heaters is the only approach that can fully eliminate the risk of Fayetteville Works PFAS contamination from water heaters.” [*Id.*].

LEGAL STANDARDS

Federal Rule of Evidence 702 permits expert testimony that is “(1) helpful to the jury in understanding the evidence or determining a fact at issue, (2) ‘based on sufficient facts or data,’ (3) the product of reliable principles and methods,’ and (4) the product of a ‘reliabl[e] appli[cation] of th[ose] principles and methods to the facts of the case.’” *Sardis v. Overhead Door Corp.*, 10 F.4th 268, 281 (4th Cir. 2021) (alterations in original) (quoting Fed. R. Evid. 702). “Rule 702 thus ‘imposes a special gatekeeping obligation on the trial judge’ to ‘ensur[e] that an expert’s testimony both rests on a *reliable* foundation and is *relevant* to the task at hand.” *Id.* (quoting *Nease v. Ford Motor Co.*, 848 F.3d 219, 229–30 (4th Cir. 2017)); *see Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 590–93 (1993). As shown below, the opinions of Dr. Gray and Mr. Griffith fall short of these requirements.

ARGUMENT

I. The Court Should Exclude Dr. Gray’s Opinions on the Binding of PFAS to Pipes and Water Heaters as Unreliable.

“Reliability” tests the rigor of the expert’s methodology. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 152 (1999). The trial court “must ensure that an expert’s opinion is ‘based on scientific, technical, or other specialized *knowledge* and not on belief or speculation.’” *Sardis*,

10 F.4th at 281 (quoting *Oglesby v. Gen. Motors Corp.*, 190 F.3d 244, 250 (4th Cir. 1999)). *Daubert* provides four non-exhaustive guideposts to aid in the reliability analysis, including “(1) whether the expert’s theory or technique ‘can be (and has been) tested’; (2) ‘whether the theory or technique has been subjected to peer review and publication’; (3) ‘the known or potential rate of error’ inherent in the expert’s theory or technique’; and (4) whether the expert’s methodology is generally accepted in his field of expertise.” *Id.* (quoting *Nease*, 848 F.3d at 229); *Daubert*, 509 U.S. at 593–94.

Dr. Gray’s opinions that PFAS binds to pipes and water heaters are not based on sufficient facts or data and are not the product of reliable principles and methods. Fed. R. Evid. 702(b)–(c). Her opinions are purely speculative and fail to evaluate any relevant data underlying foundational assumptions of her opinion. Indeed, the available data demonstrates facts that are directly opposite to the suppositions on which Dr. Gray’s opinions are based. The stark discrepancy between Dr. Gray’s assumptions and the facts at issue in this case renders her opinions unreliable.

Dr. Gray’s opinions start with the premise that the putative class members’ water sources contain bacteria. [D.E. 336-26 at 2; D.E. 343-33 (Gray Dep.) 23:16–18]. This premise is foundational to her opinion that bacteria from drinking water then combine with a biofilm to bind PFAS to pipes and water heaters. Yet she concedes that she has not seen any microbial data relating to the water other than the Cape Fear Public Utility Authority’s 2021 Annual Drinking Water Report. [D.E. 343-33 (Gray Dep.) 23:19–24:13]. Further, she is unable to identify any data that correlates biofilm levels in PFAS accumulation in the sludge of water heaters (that is, the accumulation of sediment or minerals that settles at the bottom of water heaters). [*Id.* at 26:3–16]. Her opinion thus piles speculative assumption upon speculative assumption, achieving

a result so removed from the facts of this case that it is of no help to the jury.

In fact, evaluation of available data shows no correlation between accumulation of sediment and PFAS levels in water heaters. [See D.E. 343-32 (Flanders Surrebuttal) at 11–13]. Even one of Plaintiffs’ own experts, Brien Gidlow—a civil engineer who designs water systems and consults on water-treatment issues for a living—testified that he has never seen evidence of PFAS retention in pipes, in direct contradiction to Dr. Gray’s assumptions:

Q. Have you seen any evidence of PFAS retention in any pipelines?

* * *

A. Other than in the water itself?

Q. Correct.

A. I’ve not seen any evidence of that.

[D.E. 343-34 (Gidlow Dep.) 52:21–53:3].

Courts in the Fourth Circuit routinely exclude expert opinions like Dr. Gray’s that are not based on sufficient facts or data. *See, e.g., Yates v. Ford Motor Co.*, 113 F. Supp. 3d 841, 854 (E.D.N.C. 2015) (excluding an expert’s opinion “that *any* visible dust from *any* asbestos-containing product rises to a hazardous level” when the expert “fail[ed] to note sufficient facts or data to support such a broad proposition”).

Moreover, Dr. Gray’s opinions are not the product of reliable principles and methods.

Dr. Gray opines that “scale,” which she defines as “deposition that forms and attaches to the inside surfaces of pipes,” [D.E. 343-33 (Gray Dep.) 26:25–27:2], promotes PFAS sorption and is present on all pipe surfaces and water heaters, [D.E. 336-26 ¶ 2; D.E. 343-33 (Gray Dep.) 27:24–25]. She admitted, though, that certain conditions or compounds such as calcium carbonate must be present for scale to form. [D.E. 343-33 (Gray Dep.) 30:4–31:11]. Despite

this concession, Dr. Gray testified that she has not evaluated the levels of calcium carbonate (or other compounds) in the putative class members' finished water to determine whether the conditions necessary for scale are present in the pertinent geographical area. [*Id.* at 35:25–36:14]. Critically, Dr. Gray further conceded that she has not inspected any of the putative class members' water heaters to determine whether the water heaters contain the scale or biofilms that she opines on in this case. [*Id.* at 37:11–15 (“I have not chemically analyzed or seen the chemical analysis of the sediment and the sludge that has been observed and qualitatively documented the water heaters in this area.”)]. And when asked during her deposition, she did not know the average mass of accumulated PFAS in water heaters within the region at issue. [*Id.* at 40:23–41:4]. Here again, Dr. Gray's opinions rely on speculative assumptions without any assessment of the facts in this case. Without any specific information about the conditions or compounds of the putative class members' finished water or an inspection of any putative class member's water heater, Dr. Gray is merely guessing about the accumulation of scale in the water heaters.

As the Supreme Court explained in *Daubert*, an expert's scientific methodology generally involves “generating hypotheses and testing them to see if they can be falsified.” *Daubert*, 509 U.S. at 593. Here, Dr. Gray has done nothing more than posited an untested theory on the method by which PFAS bind to pipes and water heaters. That theory, however, “is nothing more than a hypothesis, and it thus is not knowledge, nor is it based upon sufficient facts or data or the product of reliable principles and methods applied reliably to the facts of the case.” *Sardis*, 10 F.4th at 291 (quoting *Nease*, 848 F.3d at 232). Dr. Gray's opinions regarding the binding effect of PFAS on pipes and water heaters should be excluded under Rule 702 and *Daubert*.

II. The Court Should Exclude Mr. Griffith's Opinions as Unreliable Speculation Based on Inadequate Data and Unreliable Methodology.

A. Mr. Griffith's Opinion That All Water Heaters Owned by Members of the Putative Class Are Contaminated with PFAS Is Speculation Based on Inadequate Data and Unreliable Methodology.

Mr. Griffith opines that every water heater owned by members of the proposed class contains a layer of sediment containing PFAS that will continue to be a source of contamination. [D.E. 336-27 ¶ 25]. Incredibly, Mr. Griffith offers this opinion without ever having measured or tested a single water heater in order to ascertain the level, if any, of sediment present in that water heater, or its percentage, if any, of PFAS:

Q. If there was any actual hardened sediment in the water heater, that was never analyzed to determine what mass of PFAS it may contain, correct?

A. That's correct.

[D.E. 343-35 (Griffith Dep.) 28:6-9].

In fact, Mr. Griffith readily concedes that there is no way to measure or sample the actual sediment allegedly contained in hot water heaters:

Q. How will PFAS be measured in the sediment layer?

A. . . . Okay. PFAS in the sediment layer, so far, has been measured by flushing and capturing some of the sediment that escapes in that flushing process. That's how PFAS has been measured so far in sampling procedures. Now, going forward, we – the limit is up to now, that measurement is only in the sediment, the sludge that escapes the water heater. We're leaving behind the sediment layer that at least until now no one has found a way or has used any kind of method, if there is any, to measure PFAS in that sediment in the bottom of the water heater that's left behind even after flushing.

[*Id.* at 52:15-53:9].

Instead, Mr. Griffith's opinion is based on his review of samples from the taps and water heaters of residences in Brunswick, Cumberland, New Hanover, and Pender Counties that were

analyzed by GEL Laboratories. [D.E. 336-27 ¶ 30; D.E. 343-35 (Griffith Dep.) 18:20–19:6, 20:6–12]. But Mr. Griffith readily concedes that these samples measured the presence of PFAS in terms of nanograms/liters, a measurement of liquids that has no application to the presence of sediment in tap water, which would be measured as a solid:

Q. Now, in all of those, we were referring to measurements in nanograms per liter, right?

A. That is correct.

Q. And that's how the data was measured and reported, right?

A. Yes. That's correct.

Q. But nanograms per liter is a measurement used for analysis of liquids, not solids, right?

A. Yes. That's correct.

Q. It would be impossible to measure solids in terms of nanograms per liter?

A. No. That -- you're correct. That would not be the appropriate way.

Q. So based on what you just told me, even when they collected some of the actual sludge, they still measured the water and the liquid, correct?

A. Yeah – well, I think that's the way they described it, the sludge is a liquid. It may be a thick liquid.

Q. If there was any actual hardened sediment in the water heater, that was never analyzed to determine what mass of PFAS it may contain, correct?

A. That's correct. Most of the hardened sediment in a water heater, if it's very hard, solid form, actually does not come out during flushing. That would be the sediment that remains in the water heater.

[*Id.* at 25:20–26:8; 27:24–28:13].

In other words, Mr. Griffith's opinion is not based on any actual data measuring PFAS contained in alleged sediments inside water heaters, only limited data measuring PFAS out of the

tap in a liquid media that Mr. Griffith assumes must come from sediment within the water heaters. This is a failure of both data and methodology, amounting to bare speculation and supposition that falls well below what is required by Rule 702 and the *Daubert* standard.¹

B. Mr. Griffith's Opinion There Is No Methodology Currently Available to Completely Remove All Sediment from a Residential Water Heater is Based on Inadequate Data and No Methodology.

Mr. Griffith concludes that there is no methodology, including flushing or draining, capable of removing all sediment from hot water heaters. In order to reach this opinion, Mr. Griffith chooses to ignore data to the contrary, relies on non-PFAS data, and omits key analysis that could have confirmed or disproven his theory.

First, Mr. Griffith ignores the careful analysis of the NCDEQ. As part of the pilot program, NCDEQ required Chemours to collect hot-water samples after the installation of the GAC in order to evaluate whether hot-water heaters retained any PFAS compounds. The data showed that once a hot-water heater was flushed, the water coming out of the tap was non-detect or had only trace levels of PFAS. [D.E. 343-16 (Snyder Rep.) at 17 (“[I]t is highly infeasible for hot water heaters to be a significant source of PFAS after flushing with PFAS ‘free’ water.”); [D.E. 343-17 (Flanders Rep.) at 10–11 & Ex. 2-C].

Mr. Griffith was also unfamiliar with data from the USEPA Office of Research and

¹ Moreover, as noted above, Plaintiffs’ own expert—a civil engineer who designs water systems and consults on water-treatment issues for a living—disagrees with Mr. Griffith’s opinion on water-heater sediment:

- Q. Have you seen any evidence of PFAS retention in any pipelines?
A. Other than in the water itself?
Q. Correct.
A. I’ve not seen any evidence of that.

[D.E. 343-34 (Gidlow Dep.) 52:21–53:3].

Development Homeland Security Research Program indicating that flushing was successful in removing 99.9-plus percent of PFAS from water heaters. [D.E. 343-35 (Griffith Dep.) 33:25–35:19]. As Mr. Griffith explained:

- A. Okay. I am – like I said, I’m not familiar with this report or the premises that it was based on. It’s obviously in some type of a warehouse or laboratory setting, so I don’t know the details about the water heater as far as there sediment from a real-world condition or was this a new water heater that has been injected with this PFAS layer or something that’s on the previous page? So I’m not – I really can’t comment much on the result, what the takeaway is, because I just don’t have enough information to do a proper analysis.

[*Id.* at 35:8–19].

Mr. Griffith also chose to disregard data from Dr. Flanders’s analysis showing that PFAS levels in homes dropped to non-detect levels following flushing, claiming that the sample size was too small from which to extrapolate any conclusions. [*Id.* at 36:4–40:24]. And while Mr. Griffith relies on studies indicating that “flushing of plumbing systems was unable to reduce contaminant levels in the water below acceptable exposure limits,” he concedes that none of these studies involved PFAS. [*Id.* at 33:6–19]. Mr. Griffith admits that he could have checked the validity of his theory by measuring the time intervals between changes in PFAS levels in incoming water compared to PFAS levels measured out of the hot-water taps. [*Id.* at 28:24–29:12]. But neither he nor any other Plaintiffs’ expert bothered to perform this analysis. [*Id.* at 29:13–30:5].

In short, this refusal to even consider countervailing data, reliance on non-PFAS data, and failure to conduct the analysis required to confirm his theory all render Mr. Griffith’s opinion on the effectiveness of flushing unreliable and inadmissible.

C. Mr. Griffith's Opinion That All Hot Water Heaters Must Be Replaced Is Based on a Series of Assumptions That Improperly Attempt to Reverse the Burden of Proof.

Although Mr. Griffith readily admits that there are numerous ways to reduce sediment from water heaters, he claims that replacement of all water heaters is necessary because he is unaware of any method to fully remove all sediments. [*Id.* at 30:7–31:24]. He claims that replacement is necessary because neither flushing nor draining “completely eliminates the risk.” [*Id.* at 31:16–23]. But this opinion is based on the unsupported assumption that any level of PFAS presents a risk to human health, a proposition that no public health agency has ever adopted, and that Plaintiffs’ own toxicologists have disavowed. [*See* D.E. 360, Defs.’ Mem. of L. in Supp. of Mot. to Exclude Testimony of Jamie C. DeWitt & Richard L. DeGrandchamp, Ph.D. at 12–14].

In fact, Mr. Griffith makes no bones about the manner in which his opinions are based on a series of speculations and assumptions that he challenges Defendants to disprove:

- Q. Would any detectable level of Fayetteville Works PFAS contamination in the sediment layer warrant replacement of the hot water heater, in your opinion?
- A. . . . If I understand it -- this question correctly, yes, it would be my opinion that if we have contamination in the sediment layer, we do not have predictable and reliable research or testing or data that determines if that PFAS would aggregate over time, would it dissolve over time, become entrained in the water. There’s a lot of unanswered questions in this matter. So one, I don’t know that there’s a reliable way to test it. The sediment that’s in the water heater, there’s no reliable way to test it. We don’t have results from that, and we have not monitored over a long period of time to know the PFAS that is present in that sediment layer, what happens to it over time, because, again, I think we’re making the assumption that the water is filtered. If the water is not filtered, definitely, any PFAS will grow over time. If the water is filtered, I don’t know what that looks like over the life of the water heater because the life of the GAC filter is not the life of the water heater. It has to be changed periodically. We don’t know at what intervals. So if PFAS is present in the water heater, I would be of the opinion, based upon the state of the art at the

present time, that the only safe way to ensure the health and safety of the occupants would be to replace the water heater.

[D.E. 343-34 (Griffith Dep.) 56:11–57:19].

Perhaps in recognition of the lack of data supporting his opinions, Mr. Griffith attempts to reverse the burden of proof in his rebuttal report and argues that Defendants' experts have not adequately disproven his theory:

To summarize, I have found no evidence or peer reviewed research that demonstrates that all the sediment in a water heater can be removed or that all PFAS contamination in the sediment can be removed. To merely state that the known presence of PFAS in water heater sediment is unlikely to accumulate or create adverse health effects without documented proof is not adequate.

[Ex. 2 [Griffith Rebuttal Rep.) ¶ 20].

But this opinion mistakes both the burden on the party offering expert testimony and the burden on the party seeking class certification. It is the proponent of expert testimony that bears the burden of establishing its admissibility under the *Daubert* standard. *Daubert*, 509 U.S. at 592, n.2. And it is the proponent of class certification that has the burden of establishing that the requirements of Rule 23 are met. *Comcast Corp. v. Behrend*, 569 U.S. 27, 33 (2013); *Windham v. Am. Brands, Inc.*, 565 F.2d 59, 64 n.6 (4th Cir. 1977) (en banc). It is not Defendants' burden to disprove Mr. Griffith's unsupported assumptions that PFAS is present in the sediment of all water heaters owned by members of the putative class, or his unsupported theory that there is no method capable of removing that sediment short of replacement, or his assumption that replacement is necessary because any non-zero-level of PFAS poses an unacceptable risk to human health. In this case, Mr. Griffith relies on assumptions rather than data, and theories rather than a reliable methodology. For these reasons the Court should exclude his opinions.

CONCLUSION

For the reasons set forth above, Defendants respectfully request that this Court grant their motion to exclude the testimony of Kimberly A. Gray, Ph.D. and Roger W. Griffith, P.E. under Federal Rule of Evidence 702 and *Daubert*.

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Respectfully submitted,

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